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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/085,550	02/26/2002	Randy A. Barksdale	IL-10810	9843
7590	07/30/2004		EXAMINER	
Alan H. Thompson Assistant Laboratory Counsel Lawrence Livermore National Laboratory P.O. Box 808, L-703 Livermore, CA 94551			CLEVELAND, MICHAEL B	
			ART UNIT	PAPER NUMBER
			1762	
			DATE MAILED: 07/30/2004	

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>
	10/085,550	BARKSDALE ET AL.
	<b>Examiner</b>	<b>Art Unit</b>
	Michael Cleveland	1762

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on 20 May 2004.
- 2a) This action is **FINAL**.      2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 13-23 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) Claim(s) \_\_\_\_\_ is/are allowed.
- 6) Claim(s) 13-23 is/are rejected.
- 7) Claim(s) \_\_\_\_\_ is/are objected to.
- 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
    - a) All    b) Some \* c) None of:
      1. Certified copies of the priority documents have been received.
      2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
      3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                    | Paper No(s)/Mail Date. _____.   |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____. | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
|   | 6) <input type="checkbox"/> Other: _____.                                   |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 13-14, 16-21, and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Williams et al. (U.S. Patent 4,326,007, hereafter '007) and Mimura et al. (U.S. Patent 4,777,099, hereafter '099) in view of each other and further in view of Nakano et al. (U.S. Patent 5,098,813, hereafter '813).

Claims 13 and 19: '007 teaches evaporating a phosphor powder (col. 5, lines 8-15) by vacuum evaporation (col. 4, lines 29-40) via resistive heating (col. 4, lines 29-32) to deposit a phosphor layer (10) or a surface. It teaches that the process is suitable for depositing phosphor material such as activated zinc and cadmium sulfides (col. 3, lines 38-45), such as ZnS:Mn. It does not explicitly teach annealing the vacuum deposited phosphor.

'099 teaches vacuum evaporation of ZnS:Mn to form a 5000-Angstrom thick layer followed by annealing for 30 minutes at 400 °C (col. 4, lines 51-55), but it is silent as to the form of the evaporation source. Therefore, it does not explicitly teach that the phosphor is evaporated from a powder.

The selection of something based on its known suitability for its intended use has been held to support a *prima facie* case of obviousness. *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945). See MPEP 2144.07. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have deposited phosphor of '099 from a powder, as taught by '007 because '007 teaches that evaporation from powders is recognized in the art as an operative method of vacuum depositing phosphors.

'007 and '099 teach vacuum deposition of a powdered phosphor, followed by annealing, as discussed above. '007 teaches the use of tungsten basket as the powder receptacle (col. 5, lines 12-15). Therefore, '007 and '099 do not teach the use of a tantalum boat.

‘813 teaches that tantalum boats may be used as the receptacle for resistive evaporation of phosphors (col. 12, lines 44-53). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used a tantalum boat as the particular boat of ‘007 and ‘099 with a reasonable expectation of success and with the expectation of similar results because ‘813 teaches that tantalum is an operative material for boats for the vacuum deposition of phosphors.

Claims 14, 21, and 23: Both references disclose the deposition of an aluminum electrode on the phosphor layer (‘007, col. 4, lines 11-17 and col. 6, lines 8-14; ‘099, col. 3, lines 28-30). ‘099 teaches that the electrode (6) may be formed directly on the EL layer (4) (Fig. 2).

Claim 16: The evaporation occurs at, for example, 450 °C (‘007, col. 5, lines 38-39).

Claim 17: Deposition occurs preferentially at  $8.5 \times 10^{-6}$  torr (‘007, col. 6, lines 17-19).

Claim 18: The thickness of the deposited layer may be 5000 Angstroms (‘007, claim 1).

Claim 20: Because the prior art fairly suggests all of the explicitly disclosed annealing steps, such as time and temperature of treatment, the procedure must necessarily produce the claimed roughness or else must arise from essential features which are not present in the claims.

3. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Williams ‘007, Mimura ‘009 and Nakano ‘813 as applied to claim 13 above, and further in view of Moyer et al. (U.S. Patent 5,334,855, hereafter ‘855).

‘007, ‘099, and ‘813 are discussed above. ‘007 is open to the use of zinc sulfide or other phosphors (‘007, col. 3, lines 38-45; ‘099), but does not teach the use of zinc cadmium sulfide (ZnCdS).

‘855 teaches electroluminescent devices in which the phosphor layer may be zinc sulfide cadmium sulfide, or zinc cadmium sulfide (col. 2, lines 56-69). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used zinc cadmium sulfide as the particular phosphor of ‘007 and ‘099 with a reasonable expectation of success and with the expectation of similar results because ‘855 teaches that ZnCdS is an operative phosphor material for light-emitting devices.

4. Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Williams '007, Mimura '009 and Nakano '813 as applied to claim 13 above, and further in view of Ohta (U.S. Patent 5,093,210, hereafter '210).

'007, '099, and '813 are discussed above. They teach the use of aluminum as a cathode ('099, col. 3, lines 20-30; '007, col. 6, lines 4-14), but do not teach a thickness of 400-1000 angstroms.

'210 teaches that aluminum cathodes of EL devices may have a thickness of 500 angstroms (col. 19, line 66-col. 20, line 6). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used an aluminum thickness of about 500 angstroms as the aluminum thickness of '007 and '099 with a reasonable expectation of success because '210 teaches that it is an operable thickness of aluminum cathodes.

#### *Response to Arguments*

5. Applicant's arguments filed 5/20/2004 have been fully considered but they are not persuasive.

In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Applicant argues that Williams does not require a postdeposition anneal. The argument is unconvincing because it does not address the teachings of Mimura.

Applicant argues that Mimura teaches superior properties of a gadolinium oxide layer to other prior art layers and that therefore the layer is essential. The argument is faulty because Mimura equally teaches that the prior art layers are also operable, and therefore does not teach that the gadolinium oxide layer is essential. Furthermore, Applicant's claims do not exclude the use of such a layer.

Applicant argues that the phosphors in Nakano are for a different purpose than those of Williams and Mimura. The argument is unconvincing because Nakano is cited merely to demonstrate the suitability of a tantalum boat for the resistive evaporation of phosphors. The difference in the identity of the phosphors would not have disguised this teaching of suitability.

Applicant argues that Williams teaches away from the combination because it teaches that annealing is unnecessary as opposed to the prior art. The argument is unconvincing because a teaching that an anneal is unnecessary is not a teaching that annealing would render the phosphor unsuitable for its purpose. The argument also does not address that either Mimura may serve equally well as the primary reference, and explicitly teaches annealing.

In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Cleveland whose telephone number is (571) 272-1418. The examiner can normally be reached on Tuesday-Friday and alternate Mon, 8-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shrive Beck can be reached on (703) 308-2333. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.



Michael Cleveland  
Patent Examiner  
July 28, 2004